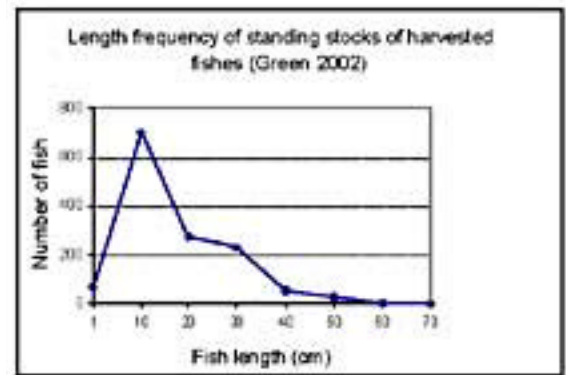


Opinion piece: Where are the fish?

By: Peter Craig

A certain unease is creeping into my view of coral reefs in American Samoa, including those in NPSA. I've been for work on coral reef issues in the territory for some 12 years. During that time, several hurricanes have come and gone. Major hurricanes strike American Samoa at intervals of about 10 years, so we see a cycle of coral reef disturbance followed by a lengthy period of recovery. The hurricane in 1991 was particularly bad -- many of our reefs were reduced to rubble and rolling hills of pink coralline algae and low-relief corals. But as the years progressed, coral growth was good and diverse thickets appeared.

The one thing that didn't seem to recover much was the fish. That's hard to gauge, of course, if we don't know how many fish used to be on our reefs. But today we see relatively few and/or small sizes of the species commonly taken for food. Figure 1 shows the pooled lengths of all parrotfish, snappers, emperors, groupers and jacks sighted during surveys in 2002. It is readily apparent that few fish were 40 cm (16 inches) or larger. Sometimes, when I stop to scan the reefs, it's a bit eerie to see few fish at all other than a sprinkling of small ones. A few years ago, one noted biologist summarized our post-hurricane recovery of corals as "the house has been rebuilt, but the rooms are empty". In other words, where were the fish?



I don't mean to imply that the hurricanes caused these problems. A much more likely culprit is fishing pressure. The general consensus among local biologists and visiting coral reef experts like Ali Green and Chuck Birkeland is that American Samoa's reefs have simply been over fished. Fish stocks may well have been depleted years ago by over fishing. Knowledgeable locals and elder Samoans recall seeing far more fish on our reefs 25 years ago. Although the current fishing level does not seem excessive, I would assume that it is at least retarding a recovery.

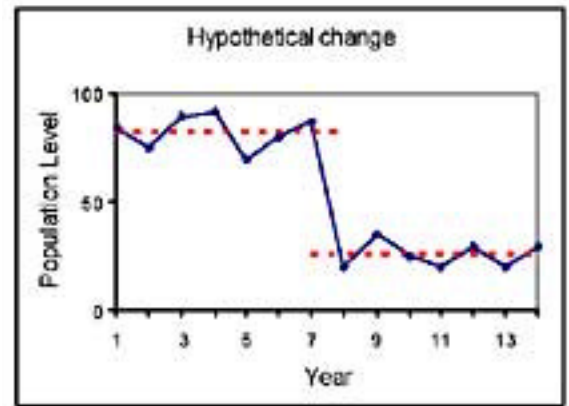
The straightforward solution is, of course, to reduce fishing pressure, but there may be more to it than that. Another little-discussed factor may also be working to keep our fish stocks at a perpetual low level: their age structure. As more and more coral reef fishes have been aged, an unanticipated pattern is emerging: they are fish far older than expected. They can live on the reef for decades; maximum ages of 20-30 years are common. Forget the old idea that coral reef fishes are generally highturnover populations that can be fished hard because they grow fast and die young. They don't.

The realization that coral reef fish can be old is not merely interesting, it has some significant management implications. A likely rationale for this life history pattern is that mortality of their young is extremely high, so a fish has to live and spawn for decades in order to insure that at least a few of its juveniles successfully make it back to the reef and grow to maturity. For all the millions and millions of eggs a fish spawns during its long lifetime, only 2 recruits must survive to adulthood in order for the population to maintain itself at its current abundance. Successful recruitment must be a very rare event. And it would be even rarer if the number of spawners was reduced to a skeleton population through over fishing.

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so a fish has to live and spawn for decades in order to insure that at least a few of its juveniles successfully make it back to the reef and grow to maturity. For all the millions and millions of eggs a fish spawns during its long lifetime, only 2 recruits must survive to adulthood in order for the population to maintain itself at its current abundance. Successful recruitment must be a very rare event. And it would be even rarer if the number of spawners was reduced to a skeleton population through over fishing.

I think we are looking at a hardened case of “recruitment over fishing” where “fishing reduces the size of the adult stock to a point where production of larvae and subsequent recruitment are impaired”. Further, I would suggest that the reduced gamete production of today’s small population, coupled with naturally occurring years of recruitment failure, makes population recovery difficult and may, in effect, hold the population down at a lower level of abundance, a sort of impoverished steady state (Fig. 2).



We might leap up and say that’s where NPSA and other MPAs come in. True in concept, but unfortunately none of our MPAs has an enforcement capability; indeed, the territory itself has little ability to conduct nighttime marine operations of any sort.

A meaningful recovery might require nothing short of a territory-wide reduction in the harvest of coral reef fishes for at least 10 years. That’s what the long life span of the fish is telling us. Additionally, a comprehensive recovery plan would need to address a number of related issues such as: (1) promote other sources of fish for consumption (such as the bycatch of pelagic fish that is discarded by the domestic longline fleet), (2) develop a policy about imported coral reef fish (ie, we shouldn’t transport our over fishing problem to another neighboring country by importing their coral reef fish), (3) prohibit export of all coral reef products, (4) strengthen territorial fisheries regulations to prevent the introduction of overly efficient types of fishing gear, and (5) implement a sound, long-term monitoring program that specifically provides quantitative data on these fisheries issues. A balanced solution might still allow some continued take for subsistence (which appears to be at a modest level and has been declining steadily over the past 20 years), but any overall strategy would need to demonstrate an actual reduction in harvest.

The Impaired Coral Reefs of NPSA, Part 2.

By: Peter Craig

-- How Do We Become More Than a "Paper Park?"

In the previous newsletter, I presented evidence that coral reefs in American Samoa are severely overfished, including reefs in the National Park of American Samoa (NPSA). Recent analyses show that we have very few large fish left (ie, fish greater than 16 inches). Birkeland (1997) notes the tremendous loss of spawning potential this can represent - one large female red snapper (24 inches) has the spawning potential of 212 smaller females (16 inches). A recovery will require nothing short of a territory-wide reduction in the harvest of coral reef fish for at least 10 years, and Marine Protected Areas (MPAs) must provide meaningful protection to stocks.

NPSA is the largest MPA in the main islands of the territory, so I went through a mental checklist to see what we are doing to reverse this "impaired" condition. Are we helping to increase fish numbers and fish sizes in our MPA by protecting them from poachers, are we reducing the number of fish that are harvested legally there, or are we improving some degraded habitat condition that might be limiting the number of fish that can live in the MPA? Well, hmmm, no. The unfortunate reality is that, at present, NPSA affords no protection to marine resources and is not likely to do so in the near future due to a variety of issues (eg, NPSA has limited resources to manage a remote park spread over 4 islands, our legislation allows subsistence fishing in the park, it is difficult to quantify what a sustainable harvest of a multi-species coral reef fishery actually is, we have no enforcement capability, jurisdiction issues need to be clarified, etc.).

So the question then becomes: how can we turn this problem around? I think the answer is that we need to set our sights on where NPSA should be in 10 years from now, and determine what steps are needed to get us there. Otherwise, the marine portion of NPSA will simply be an unfulfilled footnote in NPS history.

My thinking here is at an early stage of development. I've corresponded with Gary Davis who has recognized for some time that most of the ocean parks in the National Park Service are "impaired" to one degree or another. Gary has charted a course for recovery in his report: "Maintaining unimpaired ocean resources and experiences: A National Park Service ocean stewardship strategy". To implement the Ocean Strategy, NPS recently assembled an Ocean Park Task Force.

At some point, it will be very helpful to draw upon the Task Force's expertise to meet the challenges faced by our Pacific Island parks. I'm a bit surprised that our region does not seem to be represented on the TF, but perhaps the TF has its hands full dealing with the mainland parks. But before communicating with the TF, I wonder if any of this "ocean impairment problem" is also a concern at any of the other Pacific Island parks, or is this primarily a NPSA problem?

I realize that it may be premature for NPSA to worry excessively about these issues, but I'm bothered about how overfished our reefs are, and it's embarrassing to admit to being a paper park, even if we are doing other useful marine work. We are, for example, conducting surveys that will set the stage for a recovery effort. We are beginning to: identify important issues, inventory resources and assess their status, quantify the subsistence fishery, examine ecological threats such as coral disease and bleaching mortality, and develop a monitoring program that will be needed to track recovery as the years pass. All well and good. But these are all sort of "Phase 1" activities; "Phase 2" is to actually do something about the problem.